

M. G. OBUJEN  
JAMES C. McCUTCHEON

OBUJEN & McCUTCHEON  
OFFICIAL REPORTERS & NOTARIES  
2555 PARK BOULEVARD  
PALO ALTO, CALIFORNIA 94306  
March 28, 1980

DOCKETED  
JUL 14 1980

FILED

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Mr. Milton E. Schwartz  
National Semiconductor Corporation  
2900 Semiconductor Drive  
Santa Clara, California 95050

H. STUART CUNNINGHAM, CLERK  
UNITED STATES DISTRICT COURT

Re: Bally Manufacturing vs. D. Gottlieb & Co.  
Case No. 78C 2246 Our File No. 12684 WV/WW

Dear Mr. Schwartz:

Pursuant to instructions of counsel, we are enclosing herewith the original transcript of your deposition taken March 6, 1980, in the above matter.

Please read the transcript for accuracy and sign it, before any notary, where indicated on page 23. If you should have any corrections, please indicate them on the enclosed sheets of yellow paper; the reporter will make the actual changes in the transcript.

We will very much appreciate receiving the signed deposition back in our office by April 30, 1980, so that we may file it with the court.

Thank you.

Yours very truly,

OBUJEN & McCUTCHEON, INC.

by: Martha A. Press

encls

cc: Wayne M. Harding, Esq.  
Jerold B. Schnayer, Esq.

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF ILLINOIS

DOCKETED  
MAR 14 1980

EASTERN DIVISION

BALLY MANUFACTURING CORPORATION,

Plaintiff,

-vs-

D. GOTTLIEB & CO., a corporation,  
and WILLIAMS ELECTRONICS, INC., a  
corporation, and ROCKWELL INTERNATIONAL  
CORPORATION, a corporation,

Defendants.

No. 78C 2246

BE IT REMEMBERED that, pursuant to notice and on  
Friday, March 7, 1980, commencing at the hour of 10:20 A.M.,  
at National Semiconductor Corporation, 2900 Semiconductor  
Drive, Santa Clara, California, before me, WAYNE WALCOFF, a  
Certified Shorthand Reporter, License No. C 4382, and a Notary  
Public in and for the County of San Mateo, State of California,  
personally appeared

MILTON E. SCHWARTZ

who was called as a witness by defendants.

**OBUJEN & MCCUTCHEON**

OFFICIAL REPORTERS & NOTARIES

2555 PARK BOULEVARD

PALO ALTO, CALIFORNIA 94306

(415) 326-9920

1 ---o0o---

2 I N D E X

3  
4 Examination by:

5 Mr. Harding . . . . . Page 3

6 Mr. Schnayer . . . . . Page 16

18  
19  
20 ---o0o---

A P P E A R A N C E S

For plaintiff FITCH, EVEN, TABIN, FLANNERY & WELSH, ESQS.,  
Bally BY: JEROLD B. SCHNAYER, ESQ., and  
Manufacturing: DONALD L. WELSH, ESQ.,  
135 South LaSalle Street, Suite 900,  
Chicago, Illinois 60603

For defendants ARNOLD, WHITE & DURKEE, ESQS.,  
D. Gottlieb & BY: WAYNE M. HARDING, ESQ.,  
Co. and Rockwell 2100 Transco Tower,  
International: Houston, Texas 77056

For National MICHAEL SCHERRARD, ESQ.,  
Semiconductor: 2900 Semiconductor Drive,  
Santa Clara, California 95051

Q. What is your name?  
A. Milton E. Schwartz.

Q. What is your address?

A. 423 West 10th Street, Mountain View.

Q. Mr. Schwartz, the deposition of National

Semiconductor has been noticed pertaining to the development  
by and for Intel Corp. Inc. in Portland, Oregon of an elec-  
tron circuit board for pistol saws, including but not limited  
to the pistol saw DVC. ---oOo--- been designated by  
National Semiconductor to speak on its behalf for your knowl-  
edge of that matter.

Q. Do you understand that that is the reason you are here  
today?

A. Yes, I do.

Q. Are you employed by National Semiconductor?

A. Yes, I am.

Q. When were you initially employed?

A. July 1974.

Q. Have you been employed by National Semiconductor since that time?

1 ---o0o---

2 MILTON E. SCHWARTZ

3 having first been duly sworn by the  
4 Notary Public to tell the truth, the  
5 whole truth, and nothing but the truth,  
6 was thereupon examined and testified as  
7 follows:

8 EXAMINATION BY MR. HARDING

9 MR. HARDING: Q Please state your name for the  
10 record.

11 THE WITNESS: A Milton E. Schwartz.

12 Q What's your address?

13 A 423 Hedgerow Court, Mountain View.

14 Q Mr. Schwartz, the deposition of National  
15 Semiconductor has been noticed pertaining to the development  
16 by and for United Games Inc. in Portland, Oregon of an elec-  
17 tronic controller for pinball games, including but not limited  
18 to the pinball game OXO. You have been designated by  
19 National Semiconductor to speak on its behalf for your knowl-  
20 edge of that project.

21 Do you understand that that is the reason you are here  
22 today?

23 A Yes, I do.

24 Q Are you employed by National Semiconductor?

25 A Yes, I am.

26 Q When were you initially employed?

27 A June, '74.

28 Q Have you been employed with National since that day?

1 A Yes, on a continuous basis.

2 Q Do you recall a development by or for United Games  
3 Inc. in Portland, Oregon of an electronic controller for pin-  
4 ball games including but not limited to the pinball game OXO?

5 A Yes.

6 Q Do you recall generally whether that development  
7 took place?

8 A We started -- it would have been early '75, I would  
9 guess.

10 Q Don't guess.

11 A I don't remember the precise dates. The drawings  
12 might indicate.

13 Q Let me show you a document designated GD229. It's  
14 a letter dated May 29, 1975. I'll ask if you have ever seen  
15 that document before yesterday or today?

16 A No, I didn't see it until recently, until the other  
17 day.

18 Q Does that document refresh your recollection at all  
19 as to the approximate date of the OXO program?

20 You are nodding your head. The Court Reporter will need

21 A I'm sorry.

22 Q Let me hand you another document, GD225, and ask  
23 if you have seen that document before these depositions.

24 A Yes.

25 Q I direct your attention to Sheet 3 of 6, which bears  
26 a date, and ask if that refreshes your recollection as to the  
27 general dates of the project.

28 A I'd have to say May was about the first time we

started in on it. These represent final schematics.

Q Okay. If you just answer the question as I ask it. I'm handing you GD227 and ask if you can identify that document as something you've seen before these depositions?

A Yes.

Q What do you recognize that to be?

A This is the overall program that Al Weisberger developed for the pinball game that we prototyped.

Q After having seen these documents, does that refresh your recollection as to when this OXO development program generally took place?

A Yes, for me the date of April rings a bell. So I would say about April, April of '75.

Q Commenced approximately April, 1975?

MR. SCHNAYER: Objection, the question lacks foundation.

THE WITNESS: A Yes.

MR. HARDING: Q On what do you base your answer that it commenced in April, 1975?

THE WITNESS: A I know that the job took approximately six to eight weeks to do, and these documents are final versions of all the preliminary work that went on. I just have to backtrack from it. I knew it was early in the year. I couldn't pin it down. I do know one thing. I knew it took between six and eight weeks for us to finish it from the first time that we heard about it.

Q So you are backtracking. Do you have a date that you recall the development program to have concluded?

1 A Not a specific date.

2 Q Do you recall a date say within a month?

3 A I still say April.

4 Q No, concluded.

5 A Oh, concluded.

6 MR. SCHNAYER: Objection to the question, lacking  
7 foundation.

8 THE WITNESS: A No, not a specific date concluding.

9 MR. HARDING: Q Well, you backtracked you said  
10 six or eight weeks?

11 THE WITNESS: A I know I can calculate it.

12 Q What was the date that you backtracked from to  
13 arrive at April?

14 A Well, the final date on the print, which is in June  
15 time frame, was June 26th. Go back to May 26th, April 26th,  
16 this would be about eight weeks.

17 Q Okay. Did you have any involvement in the OXO  
18 development project?

19 A Yes.

20 Q Can you tell me what your involvement was?

21 A My involvement was doing some interface circuit  
22 design with optoisolators.

23 Q Did the interface circuit that you designed operate  
24 any specific circuitry?

25 MR. SCHNAYER: Objection to the question, mischarac-  
26 terizes his testimony.

27 THE WITNESS: A Yes, there were two particular  
28 parts. One was for a power-on initialization circuit and



power fail detect. It was sort of a combined circuit. The other was to isolate low level digital logic from solenoid logic, solenoid drivers I should say.

MR. HARDING: Q You say low level logic. You are referring to voltages?

THE WITNESS: A Five volt logic from 24 volt out relay or solenoid.

Q Did you design this circuitry?

A Yes, I did.

Q Will you review the documents that you have in front of you and see if you can point out to me the circuitry that you just testified to?

MR. SCHNAYER: Objection to the question, leading, lacking foundation.

THE WITNESS: A All the circuits that have an optoisolator in them -- I can tell you the first one in order.

MR. HARDING: Q First of all, you say that you had seen GD225 before this week; is that correct?

THE WITNESS: A Yes. This is the document I'm referring to, this circuit.

Q Did you tell me what GD225 was to your recollection?

A No, I didn't tell you what it was.

Q Would you please?

A It's a complete set of schematics representing the electrical circuitry used for the pinball controller micro-processor.

MR. SCHNAYER: Objection to the question, lacking foundation.

1 MR. HARDING: Q When did you see this drawing  
2 before this deposition?

3 THE WITNESS: A These drawings I remember seeing  
4 during development of the project, and then right at the end  
5 when the full set was finally made.

6 Q Now, would you please refer to GD225 and point out  
7 if you can the interface circuit that you've talked about?

8 A I'm on Sheet 2 of 6.

9 MR. SCHNAYER: Objection to the question, lacking  
10 foundation.

11 THE WITNESS: A I'm on the top section of the  
12 circuit. It shows a 28 volt AC signal coming in, which is  
13 directly from a transformer interfaced to an optoisolator.

14 MR. HARDING: Q Now, can you talk in terms of  
15 components for the record?

16 THE WITNESS: A The 28 volt AC source is inter-  
17 faced to one side of this optoisolator, which is a NCT200.  
18 It was National's optoisolator.

19 Q You have been pointing to a circuit in the upper  
20 left-hand center of the page, Roadmap D.

21 A Three, four and almost two.

22 Q When you refer to the NCT200, I notice on the draw-  
23 ing there is a circle and then a letter.

24 A Yes, this is the NCT200. It's represented elec-  
25 trically by a diode and by a transistor. The resistor is not  
26 part of the optoisolator.

27 Q Then there is a designation 2F with an arrow to  
28 that.

1 A. Yes, that would be a physical location of the device  
2 on the assembly drawing. Every device has a location so when  
3 you go troubleshooting, you can find it on the printed circuit  
4 board, printed wiring board.

5 Q. The job of this circuit was twofold. Number one, it was  
6 to provide an initialized signal to the processor, to the  
7 whole system.

8 Q. Do you recall the designation of that initialized  
9 signal?

10 A. The initialized signal was called NINIT.

11 Q. Was that shown on Sheet 2?

12 A. Yes, it's at location D2, approximately.

13 Q. The second part of this circuitry was to detect power  
14 failure and restart the machine, or provide a second NINIT  
15 clear. The main idea was that if somebody jockeyed around  
16 or pulled a plug and tried to put it back in again, trying to  
17 play around with the machine, it would automatically reinitial-  
18 ize the electronic circuitry, and everything would show up as,  
19 you know, starting all over again.

20 Q. Do you recall why you used an interface circuit  
21 with an optoisolator?

22 MR. SCHNAYER: Objection, the question is leading.

23 THE WITNESS: A. Yes. For this particular part of  
24 the circuit, the trick was to detect the loss of a few cycles  
25 of AC wave form, meaning that the power had disappeared.  
26 That's what it was going to mean to the system.

27 A very convenient way -- kind of common I guess -- to  
28 interface this type of circuitry, would be to use an

optoisolator. It makes life very easy.

MR. HARDING: Q You indicated it was kind of common. Did you have something specifically in mind?

THE WITNESS: A Well, used optoisolators previously or suggested them.

Q Who had?

A I had with previous companies for a similar kind of approach.

Q Can you tell me about those?

A One of the first thoughts that comes to mind is building a clock circuit using -- 60 cycle was the clocking mechanism and the clock circuitry to be designed with digital low level logic, five volt logic. Somehow you have to get the AC signal to look like little five volt pulses; one pulse every 16 milliseconds to the digital logic. This was one of the easiest ways to do it. It was to just take the AC voltage and use the optoisolator, doing two things for you.

Number one, it really only works on the positive conduction signal, the AC signal. So what you get out of the optoisolators are little pulses, zero to five volts worth, depending upon the resistor and voltage that you apply to the transistor side of the optoisolator.

So every time there is a AC positive going pulse, you get a small digital pulse. The diode portion of the optoisolator acts as a partial rectifier, if you will. You never see the negative going signal portion of the AC.

Q When approximately in time was this work done by yourself?

1 A At least once during the interval of time from  
2 October, '67 through '70, 1970, at which time I was employed  
3 at Signetics as a Digital Application Engineer; also at least  
4 once at Fairchild, where I was employed from '71 through '74.

5 Q To your recollection, did the OXO controller -- is  
6 that a proper term to call it, a controller? I'm referring to  
7 the product that resulted from National's effort in the OXO  
8 game. If you have a more appropriate term, please suggest it.

9 A It's a little difficult for me to answer as a con-  
10 troller.

11 Q What term would you prefer?

12 A If you want to quote me, I'd say more a bookkeeper,  
13 although there was action taken. The main job of the micro-  
14 processor in this aspect of the game was to sense events  
15 happening, and then keep track of how they happened by giving  
16 scores, by lighting up lights. Myself personally, I think of  
17 a controller as some kind of a feedback mechanism where you  
18 sense inputs and take action that reffects these inputs again.

19 Q To your recollection, did whatever National developed  
20 for OXO employ any solenoids?

21 A Yes.

22 Q What is your recollection that it employed?

23 A Well, I specifically remember a ball kicker.

24 Q Did you have any responsibilities in designing  
25 circuitry for operating the solenoid ball kicker?

26 A Yes.

27 Q Can you tell me what that was?

28 A Again, an interface problem following the solenoid

1 was activated by relatively high voltage compared to the  
2 logic circuitry, 28 volts DC as opposed to five volts DC,  
3 basically for the logic.

4 When solenoids are activated, a tremendous amount of  
5 electrical noise is generated. If both the logic and the  
6 solenoids were to be run off like a common supply of some  
7 sort, you would probably get a lot of logic errors. This is  
8 something that we knew ahead of time, and it wasn't even a  
9 question of trying to drive directly.

10 I knew we had to have an interface, and again a very  
11 common one for this kind of setup for those days was opto-  
12 isolation.

13 Q How did you know this ahead of time?

14 A From prior experience, having directly driven relays  
15 with digital logic, and used digital logic to directly drive  
16 a transistor, which then drove a solenoid. I had run into a  
17 lot of noise problems and so --

18 Q The optoisolation techniques that you were aware of  
19 at that time solved those problems?

20 A Yes.

21 MR. SCHNAYER: Was he looking at a document when he  
22 was testifying?

23 MR. HARDING: No.

24 THE WITNESS: When I gave him the previous answer?

25 MR. SCHNAYER: Yes.

26 THE WITNESS: No, not really.

27 MR. HARDING: Q Did you design the optoisolation  
28 circuit that you referred to in connection with the ball kicker



solenoid?

THE WITNESS: A Yes.

Q Can you find it in Document GD225?

A Yes. It's on Sheet 6 of 6 in Section B1 and 2.

Q Did that unit also employ a National Semiconductor optoisolator or product?

MR. SCHNAYER: Objection, the question is vague.

THE WITNESS: A The same optoisolator was used for all the optoisolation to the best of my knowledge. That was a NCT200. I think I stated that earlier.

MR. HARDING: Q Did there ever come a time when your design work in the project was completed? Do you understand my question?

THE WITNESS: A No, I need a repeat on it.

Q You've testified that you designed interface circuitry including the solenoid ball kicker interface and the power up and the initialization interface circuitry. Did you design any additional circuits?

A Not really. The rest of the optoisolation circuits that we used once the first two were done, we were essentially a duplicate circuitry, same kind of application. There were more solenoids to drive and more lights to drive from high voltage sources.

Q Did there come a time when you considered that your design efforts in connection with the OXO development were completed?

A Yes.

Q Did you observe operation of the optoisolator

1 circuitry to determine whether it overcame any problems which  
2 might otherwise have been present?

3 A Yes.

4 Q What did you observe?

5 A Well, two observations: One, the first circuit,  
6 which was for the power-on initialize and then detect power  
7 failure, had to be observed to work when the microprocessor  
8 and program was developed. So I was involved in the project  
9 when those times came about. When the programmer had done  
10 its portion of the program to check that circuitry out,  
11 observed that that worked out right. Same thing with the ball  
12 kicker. Make sure that the circuitry worked correctly with  
13 respect to the program.

14 MR. SCHNAYER: Objection to the question, lacking  
15 foundation, also hearsay.

16 MR. HARDING: Q You observed this personally;  
17 is that correct?

18 THE WITNESS: A Yes.

19 Q Did you observe whether the circuits functioned  
20 according to your expectations?

21 A As far as I was concerned, once they showed reli-  
22 ability, repeatability in conjunction with the program, yes.  
23 I had looked at some wave forms with the scope, but that  
24 doesn't tell the whole story. The final picture is that the  
25 circuitry works as intended with the interface.

26 Q Did you ever form an opinion as to whether the  
27 circuitry did, in fact, work as you expected it in the system?

28 A As far as I was concerned, yes. I felt it worked



fine. We had tried it many, many times. Once no problems occurred, it was very repeatable and reliable, I was satisfied that it didn't need any more design work.

MR. SCHNAYER: Objection to the last two questions, assuming facts not in evidence.

MR. HARDING: Q I want to refer back to the term "bookkeeper" that you suggested. You mentioned that the game sensed events happening, and then kept track of the events and operated scores and lights. You did not mention the solenoid. Is the solenoid also included in that definition of bookkeeper?

THE WITNESS: A Yes, it's an action taker. But as I said a little earlier, I have my own definition of a controller, and it's one where the action taken directly ends up affecting the inputs. You take new actions. In this case, a human being is sort of the one that's in between. It's not a direct feedback connection. You sense an event and take action. There is a certain amount of control involved. I can't deny that. The term control can get to be a little difficult to maybe define.

Q Did there ever come a time when the development work done by the National group was ever placed in an OXO game?

MR. SCHNAYER: Objection to the question, lacking foundation.

MR. HARDING: Q You can say yes or no to your recollection.

THE WITNESS: A Yes, the prototype unit.

Q How do you know that that happened?

1 A The OXO people had delivered to us what we call  
2 their first prototype. It was the stand and mechanical drivers,  
3 and we interfaced or electronicized it, if you will. The job  
4 was finally finished, and that prototype was shipped back to  
5 them after the game had been played by many people; I couldn't  
6 count the individuals. But I played it, several other  
7 engineers who weren't even connected with the project also  
8 played it, and you might say it was the only game in town.  
9 It was shipped working.

10 Q Did you ever form an opinion based on your play of  
11 the game whether or not the game played acceptably?

12 A I would say so. It ran the scores up the way the  
13 program designated them. I guess I would have liked a  
14 machine that tilted more. But it had a tilt indicator in it.  
15 It seemed acceptable for the way the ground rules had been  
16 proposed to us as to what had to be done.

17 MR. HARDING: Okay, no more questions.

18 EXAMINATION BY MR. SCHNAYER

19 MR. SCHNAYER: Q Now, I believe you testified  
20 previously that the Exhibit GD225 was a finalized version of  
21 the schematics for the OXO game; is that correct?

22 THE WITNESS: A Yes.

23 Q How do you know that they are the finalized --

24 A The best I could say is that I remember the prints  
25 being finally drawn up by Keith Winter after a lot of inter-  
26 mediate circuit design was done, and I recall seeing a set of  
27 the prints.

28 Q You believe that these are the prints that you saw?

1 A Yes.

2 Q Is there a practice at National to draw up finalized  
3 versions of prints of products that are going to be put into  
4 production?

5 A Yes.

6 Q What is that practice?

7 A Any National product that's put into production has  
8 a whole series of documentation that has to be prepared  
9 before the product can be released out of engineering. There  
10 is a formalized setup with control numbers. It's National's  
11 own products that are developed.

12 Q Are copies of these documents that you see before  
13 you -- are those finalized drawings that would indicate that  
14 a product had been put into production or had been finally  
15 accepted by engineering?

16 A It's different from a National product that would  
17 go out the door.

18 Q Have you ever seen any other finalized drawings of  
19 National of this development work on the OXO game done by  
20 National?

21 A No, those are the only ones that I recall.

22 Q Do you have any understanding as to whether other  
23 schematics were generated besides these final production  
24 schematics -- excuse me -- final engineering schematics?

25 A Nothing in addition to those. Prior, you know,  
26 what goes on during the initial circuit development is eight  
27 and a half by eleven type schematics. Once it's proofed out,  
28 then it's drawn up, and everybody can understand exactly how

1 it works.

2 Q Do you have any understanding as to whether any of  
3 the design work that was designed that you were involved in  
4 for the OXO game actually resulted in the manufacturing of a  
5 product to be sold to United Games?

6 A I'd have to say no, except with an exception; the  
7 concept of this game was that from our standpoint we were  
8 hoping our PACE application card would be used as the heart  
9 of the system, the microprocessor application card. But as  
10 far as I know, it never went into production in that game.

11 Q Do you have any understanding as to after the proto-  
12 type was delivered to the people at United Games as to whether  
13 there were any OXO games which were sold commercially con-  
14 taining the design work that you had been involved in?

15 A I don't have any information about that at all.

16 Q Did you ever hear any discussion about what happened  
17 to the project, if anything, after the prototype was delivered  
18 to United?

19 A No.

20 Q Was there ever any telephone calls to your office?

21 A Not to me.

22 Q I show you Document GD228, and ask you if you  
23 recognize that to be a copy of something you've seen before?

24 A Yes.

25 Q What is that a copy of?

26 A That was the artist's conception of what the final  
27 game should be. These are already made up by the OXO people,  
28 and they were shown to us prior to us even developing anything.

1 Q So you actually received a copy of this from some-  
2 body from OXO?

3 A Yes.

4 Q Who were the people involved that you were involved  
5 with from United Games in this project?

6 A I don't really recall the gentleman's name. There  
7 was one individual that I recall who was down several times  
8 that personally delivered the whole box to us. Drove down  
9 from Washington or Oregon, wherever they were based at at the  
10 time. I didn't have much interface with the customer directly.

11 Q Did you ever hear any discussion of the type of  
12 company United Games was?

13 A Not that I recall, other than a game type outfit.

14 Q Do you recall anything else about the company, any  
15 discussion about what type of company it was, and how big  
16 they were, what type of offices they had, facilities?

17 A No, not really. I guess I felt that it was the  
18 marketing and sales people's job to know that it was hopefully  
19 someone that was good business for us. My job as a technical  
20 support for those groups was just to do my best to make a  
21 design to help the customer out so we could sell parts to him  
22 so he could sell his product. I never much get involved in  
23 the business aspect at all.

24 Q But you have no knowledge of whether parts were  
25 actually sold to be put into OXO machines; is that correct?

26 A That's correct, other than the prototype that we  
27 delivered.

28 Q Now, I notice there is a silver label that appears

1 to be a stick-on label on this Document GD228. It says,  
2 "Powered by PACE microprocessor." When you received this  
3 sheet, GD228, did it contain that silver label?

4 A The very first one didn't. We were shown some of  
5 these without that, and then I guess as a token gesture by  
6 the United Game people, they made up the sticker, "Powered by  
7 PACE."

8 Q That was sometime subsequent to the original docu-  
9 ment that you saw without these stickers; is that correct?

10 A Yes.

11 Q Do you know where they got the stickers from?

12 A No.

13 Q When you say you saw copies of these with the  
14 stickers on them, that was during the development work that  
15 you were involved in with the OXO game; is that correct?

16 A I wouldn't recall the very first time that I saw it  
17 with the sticker put on it. I recall the picture being shown  
18 showing the basic advertisement prior to us doing anything.

19 Q Prior to your starting in this project, your por-  
20 tion of the project that you worked on, what was your  
21 familiarity with pinball machines, if you had any?

22 A I used to play them a lot as a youngster in the  
23 days when they paid money when you won.

24 Q Did you ever have occasion to open up a pinball  
25 machine and look inside?

26 A No.

27 Q Prior to the completion of this project, had you  
28 ever heard of any work done by anybody else in the design of a



1 solid state pinball machine?

2 A No.

3 Q And that includes either pinball machine manufac-  
4 turers or microprocessor manufacturers.

5 A That's correct. This was the first time, as far as  
6 I was concerned, that a pinball game was going to be elec-  
7 tronicized.

8 Q Do you know if United Games is still in existence  
9 today?

10 A No, I wouldn't know for sure.

11 Q After the completion of the project or what you  
12 considered to be your aspect of the completion, did you have  
13 any further contact with United Games?

14 A No.

15 Q Did you ever hear the name United Games mentioned  
16 in a conversation after that point?

17 A Well, during the roughly eight weeks of the project,  
18 I was out of it from the actual project. I was more of an  
19 observer and maybe consultant, played with it and had to be  
20 around to make sure that the circuitry that I did develop  
21 worked. So the brochures were around, and there were the  
22 words United Games, and people would talk about OXO; just  
23 small kind of talk. After the delivery of it, I don't recall  
24 much of any discussion about it after we delivered the proto-  
25 type.

26 Q Have you ever authored an article or have been  
27 enjoined to author an article that contained any description  
28 of pinball machines using a SC/MP microprocessor?

1           A     I'd have to review some of the literature. I  
2 coauthored several articles for SC/MP and there were a myriad  
3 of applications we envisioned for it. I wouldn't be surprised  
4 at all if one that was coauthored by myself might have  
5 involved a pinball game. I know there was a fish tank control  
6 in it, myriad of other applications. But I would have to look  
7 at the articles. Those were quite some time ago.

8           Q     When was the first time that you ever heard of any  
9 work being done on solid state pinball machines by anybody  
10 after this project?

11          A     Well, I guess only direct knowledge was very recently.  
12 It would be from outside this company. An acquaintance  
13 mentioned electronicized pinball games. I sort of joked with  
14 him about it. I said, "Oh, we were one of the first ones to  
15 probably do something like that." I mentioned the game that  
16 I had done my little part in. But I haven't followed it. I  
17 don't have any direct knowledge.

18          MR. SCHNAYER:     That concludes my questions, thank you.

19          MR. HARDING:     Thank you, Mr. Schwartz.

20          National has requested that certain of its originals be  
21 returned to National, and I'd like Mr. Schnayer to agree that  
22 we can substitute copies for those documents.

23          MR. SCHNAYER:     Yes.

24          MR. HARDING:     We also agree that the witness can sign  
25 the transcript in front of any notary public and return it  
26 for filing.

27          MR. SCHNAYER:     Yes.

28        //



1 MR. HARDING: That's all witnesses.  
2  
3  
4

5 Milton E. Schwartz  
6 Milton E. Schwartz  
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15

16 Subscribed and sworn to before me

17 this 15TH day of APRIL, 1980.

18 Sandra R. Miller  
19 Notary Public in and for the

20 County of SANTA CLARA,

21 State of CALIFORNIA.

